Claims:

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1. A method for amplification of at least one nucleic acid comprising the following steps:-

(1) forming at least one nucleic acid template comprising the nucleic acid(s) to be amplified, wherein said nucleic acid(s) contains at the 5' end an oligonucleotide sequence Y and at the 3' end an oligonucleotide sequence Z and, in addition, the nucleic acid(s) carry at the 5' end a means for attaching the nucleic acid(s) to a solid support;

(2) mixing said nucleic acid template(s) with one or more colony primers X, which can hybridize to the oligonucleotide sequence Z and carries at the 5' end a means for attaching the colony primers to a solid support, in the presence of a solid support so that the 5' ends of both the nucleic acid template and the colony primers bind to the solid support;

(3) performing one or more nucleic acid amplification reactions on the bound template(s), so that nucleic acid colonies are generated.

2. A method as claimed in claim 1, wherein the oligonucleotide sequence Z is complementary to oligonucleotide sequence Y and colony primer X is of the same sequence as oligonucleotide sequence Y.

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3. A method as claimed in claim 1, wherein two different colony primers X are mixed with said template(s) in step (2), and wherein the sequences of colony primers X are such that the oligonucleotide sequence Z can hybridise to one of the colony primers X and the oligonucleotide sequence Y is the same as one of the colony primers X.

4. A method for amplification of at least one nucleic acid comprising the following steps:-

(1) forming at least one nucleic acid template comprising the nucleic acid(s) to be amplified, wherein said nucleic acid(s) carry at the 5' end a means for attaching the nucleic acid(s) to a solid support;

(2) mixing said nucleic acid templates with one or more degenerate colony primers X, which can hybridize to an oligonucleotide sequence in said template(s) at a site flanking the nucleic acid sequence which is to be amplified and carries at the 5' end a means for attaching the colony primers to a solid support, in the presence of a solid support so that the 5' ends of both the nucleic acid template and the colony primers bind to the solid support;

(3) performing one or more nucleic acid amplification reactions on the bound template(s), so that nucleic acid colonies are generated.

5. A method as claimed in any one of claims 1 to 4 comprising the additional step of performing at least one step of sequence determination of one or more of the nucleic acid colonies generated.

6. A method as claimed in claim 5 wherein the sequence determination step(5) involves the incorporation and detection of labelled oligonucleotides.

7. A method as claimed in claim 5 or 6 wherein the full or partial sequences of the amplified nucleic acid templates present in more than one nucleic acid colonies are determined simultaneously.

8. A method as claimed in any one of claims 1 to 7 comprising the additional step of visualising the colonies generated.

9. A method as claimed in claim 8 wherein said visualisation step involves the use of a labelled or

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unlabelled nucleic acid probe.

10. A method as claimed in any one of claims 1 to 9, wherein the means for attaching the nucleic acid template(s) and the colony primers to the solid support comprises a means for attaching the nucleic acid sequences covalently to the said support.

11. A method as claimed in claim 10, wherein said means for attaching the nucleic acid sequences covalently to the solid support is a chemically modifiable functional group.

12. A method as claimed in claim 11, wherein said chemically modifiable functional ~~group~~ is a phosphate group, a carboxylic or aldehyde moiety, a thiol, a hydroxyl, a dimethoxytrityl (DMT), or an amino group.

13. A method as claimed in claim 12, wherein said chemically modifiable functional group is an amino group.

14. A method as claimed in any one of claims 1 to 13 wherein said solid support is selected from the group comprising latex beads, dextran beads, polystyrene, polypropylene surface, polyacrylamide gel, gold surfaces, glass surfaces and silicon wafers.

15. A method as claimed in claim 14, wherein said solid support is glass.

16. A method as claimed in any one of claims 1 to 15 wherein the density of nucleic acid colonies generated is 10,000/mm^2 to 100,000/mm^2.

17. A method as claimed in any one of claims 1 to 16 wherein the density of colony primers X attached to said

solid support is at least 1 fmol/mm^2.

18. A method as claimed in any one of claims 1 to 17 wherein the density of nucleic acid templates is 10,000/mm^2 to 100,000/mm^2 .

19. A plurality of different nucleic acid templates comprising the nucleic acids to be amplified, wherein each of said nucleic acids contain at their 5' ends a known oligonucleotide sequence Y and at the 3' end a known oligonucleotide sequence Z and, in addition, the nucleic acid(s) carry at the 5' end a means for attaching the nucleic acid(s) to a solid support.

20. The plurality of nucleic acid templates of claim 19 wherein oligonucleotide sequence Z is complementary to oligonucleotide sequence Y.

21. The plurality of nucleic acid templates as claimed in claim 19 when mixed with a plurality of colony primers X which can hybridise to the oligonucleoide sequence Z and carry at their 5' ends a means for attaching the colony primers to a solid support.

22. The plurality of nucleic acid templates as claimed in claim 21, wherein the oligonucleotide sequence Z is complementary to oligonucleotide sequence Y and colony primer X is of the same sequence as oligonucleotide sequence Y.

23. A plurality of nucleic acid templates as claimed in claim 19 when mixed with two different colony primers X, and wherein the sequences of colony primers X are such that the oligonucleotide sequence Z can hybridise to one of the colony primers X and the oligonucleotide sequence Y is the same as one of the colony primers X.

24. A plurality of nucleic acid templates as claimed in claim 21 wherein the colony primers X comprise a degenerate primer sequence and the nucleic acid templates do not contain oligonucleotide sequences Y or Z.

25. A solid support, to which there is attached a plurality of colony primers X as defined in any one of the previous claims and a plurality of nucleic acid templates as defined in any one of claims 19 to 24.

26. A solid support as claimed in claim 25 wherein the solid support is as defined in claims 14 and 15.

27. A solid support as claimed in any one of claims 25 or 26 wherein the attachment of nucleic acid templates and colony primers to the solid support is covalent.

28. A solid support comprising one or more nucleic acid colonies generated by a method as defined in any one of claims 1 to 18.

29. Use of the solid support of any one of claims 25 to 28 in methods of nucleic acid amplification or sequencing.

30. Use as claimed in claim 29 wherein said method is a method as claimed in any one of claims 1 to 18.

31. Use of a method of any one of claims 1 to 18, for nucleic acid amplification or sequencing.

32. Use of a method as defined in any one of claims 1 to 18 or the nucleic acid colonies generated by said methods, or the plurality of nucleic acid templates of claims 19 to 24, or the solid supports of claims 25 to 28, for providing nucleic acid molecules for sequencing

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and re-sequencing, gene expression monitoring, genetic diversity profiling, diagnosis, screening, whole genome sequencing, whole genome polymorphism discovery and scoring and the preparation of whole genome slides, or any other applications involving the amplification of nucleic acids or the sequencing thereof.

33. A kit for use in nucleic acid amplification or sequencing comprising a plurality of nucleic acid templates as defined in any one of claims 19 to 24 and colony primers as defined in any of the preceding claims bound to a solid support.

34. A kit as claimed in claim 33 for use in sequencing, re-sequencing, gene expression monitoring, genetic diversity profiling, diagnosis, screening, whole genome sequencing, whole genome polymorphism discovery and scoring, or any other applications involving the amplification of nucleic acids or the sequencing thereof.